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BOTANICAL SERIES VOL. IV, NO. 9

HONDURAN MOSSES

COLLECTED BY PAUL C. STANDLEY

BY

EDWIN B. BARTRAM

B. E. DAHLGREN
Acting Curator, Department of Botany
EDITOR

CHICAGO, U. S. A.
December 10, 1929

CAMPYLOPUS HONDURENSIS AND SPLACHNOBRYUM BERNOULLII.

N.H.L

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Very little is known with regard to the mosses of Honduras outside of a few scattered records, evidently representing random or casual gatherings. The collection made by Mr. Standley during the winter of 1927-28 is therefore of unusual interest as it gives us the first general idea of the mosses of this Central American Republic and their relationships with the surrounding regions that are better known bryologically. The data are still too meagre to afford any satisfactory outline of geographical distribution but, in a general way, the bonds are very evidently and naturally with Mexico and the Antilles rather than with the cordilleran types of Costa Rica and Panama to the south and west.

The occurrence in Honduras of *Crossomitrium Herminieri* and *Leucoloma tortellum*, previously known only from Guadeloupe and Trinidad, and of the Brazilian species, *Meesea Ulei* and *Macromitrium Podocarpi*, together with many of the more familiar West Indian types, is strongly suggestive of a land bridge across the Caribbean banks to Jamaica and through the arc of the Antilles to South America, but the true significance of these facts may well wait for more detailed substantiation.

The 178 numbers comprised in this collection represent seventy-nine species, including four new species, *Campylopus hondurensis*, *Bryum Standleyi*, *Bryum bursiforme*, and *Rhynchostegium patulum*, which are described and figured below. The types of these new species and a complete series of specimens are in the herbarium of Field Museum of Natural History and in the herbarium of the writer.

About three-fourths of the specimens are from the Department of Atlántida,[1] on the north coast, and the remainder from the Department of Comayagua in the interior. The localities with

[1]Science 78: 265. 1928.

their corresponding sequence of numbers and field data are as follows:

52636-54198.—Lancetilla Valley, near Tela, Department of Atlántida, altitude 20-600 meters, December 6, 1927-March 20, 1928.

54261-54285.—Vicinity of Tela, Department of Atlántida, at sea level, December 14, 1927-March 15, 1928.

54326-55657.—Lancetilla Valley, near Tela, Department of Atlántida, altitude 20-600 meters, December 6, 1927-March 20, 1928.

55727-55784.—La Fragua, Department of Atlántida, altitude 20 meters, February 7, 1928.

55796-55803.—Lancetilla Valley, near Tela, Department of Atlántida, altitude 20-600 meters, December 6, 1927-March 20, 1928.

55844-56053.—Vicinity of Siguatepeque, Department of Comayagua, altitude 1,080-1,400 meters, February 14-27, 1928.

56101-56162.—In pine forest, El Achote, near Siguatepeque, Department of Comayagua, altitude 1,500 meters, February 18, 1928.

56201-56536.—Vicinity of Siguatepeque, Department of Comayagua, altitude 1,080-1,400 meters, February 14-27, 1928.

56704.—Lancetilla Valley, near Tela, Department of Atlántida, altitude 20-600 meters, December 6, 1922-March 20, 1928.

FISSIDENTACEAE

Fissidens Kegelianus C. M.

Nos. 55299, 55547, 55576.

This species occurs rather frequently in Mexico, reaches the southern border of the United States in Louisiana near New Orleans, and ranges through the West Indies to northern South America, but this appears to be the first collection from any of the Central American countries. The lax areolation of the duplicate blades, especially toward the costa, readily distinguishes this species from its congeners in the section *Bryoidium*.

Fissidens circinans Schpr.

No. 56201.

Fissidens asplenioides (Sw.) Hedw.

No. 56383.

DICRANACEAE

Trematodon reflexus C. M.
Nos. 53185, 54036.

Dicranella Herminieri Besch.
No. 54027.

Campylopus subleucogaster (C. M.) Jaeg. & Sauerb.
Nos. 56108, 56117.

Campylopus hondurensis Bartr., sp. nov. PLATE XVII, FIGS. A-J.

Dioicous. Plants densely cespitose, yellowish green at the tips, light brown below. Stems erect, 10-15 mm. high, radiculose throughout, simple or sparingly branched, when sterile usually with apical clusters of short, brittle, microphyllous branches that evidently serve as a means of vegetative reproduction; leaves erect and flexuose when dry, spreading and somewhat secund when moist, oblong-lanceolate, carinate, about 3 mm. long, tapering gradually to a relatively short, grooved point; margin plane, minutely denticulate for a short distance below the apex, entire below; costa about 180 μ wide at the base, tapering upward and percurrent or ending just below the blunt apex, slightly ridged on the dorsal side and denticulate on the back near the apex, in cross-section near the middle showing a row of large cells on the ventral surface, a median row of somewhat smaller, irregular cells and a dorsal band of stereid cells with the outer layer differentiated; alar cells conspicuous, brownish or hyaline, extending to the costa, the cells just above short-rectangular, in vertical rows with thin, straight walls, averaging about 30 μ long by 25 μ wide toward the costa, gradually smaller toward the margins and upward, upper cells small, rhomboidal, chlorophyllose; seta 7-8 mm. long, reddish, strongly cygneous both moist and dry so that the capsules are usually imbedded in the axils of the upper leaves; capsule ovoid, symmetrical, furrowed when dry, 1.5 mm. long without the lid; exothecal cells linear, incrassate, strongly nodulose; annulus about 35 μ high; peristome teeth deep red and vertically striate about halfway up, pale and papillose above, divided to about the middle into two slender forks; operculum conic-rostrate, 1 mm. long; calyptra extending a little below the middle of the urn, cucullate, deeply fringed at base, radiculose at apex when imbedded in tomentum of upper stem; spores smooth, 10 μ in diameter.

TYPE: In pine forest, El Achote near Siguatepeque, Department of Comayagua, Honduras, altitude 1,500 meters, February 18, 1928, *Paul C. Standley 56157a*. Also from same locality, on log, *No. 56149a*.

The symmetrical capsules and lax basal leaf cells suggest a comparison with *C. subleucogaster* but the Honduran plant is clearly distinguished by the smaller leaves with shorter points, narrower costa ending in or below the apex, conspicuous alar cells, long ciliate calyptra, and the apical clusters of microphyllous branches.

Campylopus introflexus (Hedw.) Brid.
Nos. 55884, 56280.

Atractylocarpus costaricensis (C. M.) R. S. Williams.
No. 56399.

Holomitrium arboreum Mitt.
No. 54188.

Leucoloma serrulatum Brid.
No. 53184.

Leucoloma tortellum (Mitt.) Jaeg.
No. 53218.

The widely spreading leaves with crispate points when dry are not at all suggestive of the more familiar species of this genus. Unfortunately Mr. Standley's collection is sterile, as are those from Trinidad and Guadeloupe, so that the sporophyte characters are still unknown, but it is interesting to record this rare species from the continental mainland for the first time.

LEUCOBRYACEAE

Leucobryum antillarum Schpr.
No. 56394.

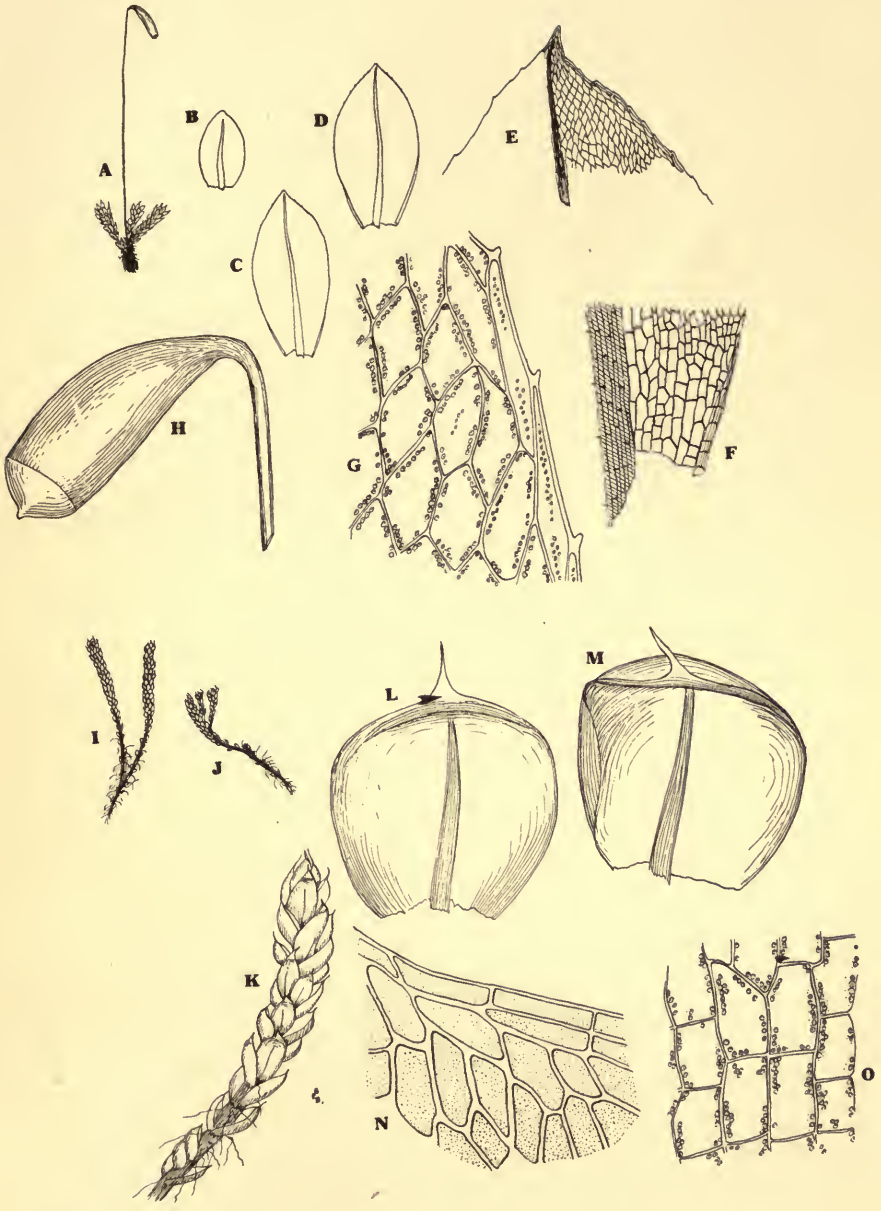
Leucobryum Polakowskyi (C. M.) Card.
No. 56149.

Octoblepharum albidum (L.) Hedw.
Nos. 53481, 54094, 54285, 54387, 55248, 55345.

Octoblepharum pulvinatum (Doz. & Molkb.) Mitt.
Nos. 52734, 54179.

CALYMPERACEAE

Syrrhopodon incompletus Schwaegr.
Nos. 52763, 53987, 54284, 55441.



BRYUM STANDLEYI AND BRYUM BURSIFORME.

Calymperes emersum C. M.
No. 54376.

The type collection from Guatemala and one from southern Florida seem to be the only previous records for this little known species.

POTTIACEAE

Trichostomum jamaicense (Mitt.) Jaeg.
No. 56416.

Leptodontium sulphureum (C. M.) Mitt. var. **Motelayi** (R. & C.) Bartr.
No. 56102.

Hyophila Tortula (Schwaegr.) Hamp.
No. 54895.

FUNARIACEAE

Funaria epipedostegia Card.
No. 56420.

Funaria calvescens Schwaegr.
Nos. 53159, 55523, 56155, 56536.

SPLACHNACEAE

Splachnobryum Bernoullii C. M. Plate XVII, Figs. K-T.
No. 53516.

BRYACEAE

Bryum bursiforme Bartr., sp. nov. PLATE XVIII, FIGS. I-O.

Evidently dioicous. Densely tufted, about 2 cm. high, pale whitish green, not glossy, when dry. Stems reddish, variously branched, branches claviform, loosely foliate below, julaceous above the middle especially when moist; leaves orbicular or broader than long, 0.5-0.6 mm. long, rather flattened and fan-shaped when dry, densely imbricated, abruptly short-apiculate, very concave or cochleariform when moist with a sac or pocket of colorless cells just below the acumen, lightly sulcate in the median portion; margin entire, plane below, broadly reflexed toward the base of the apiculus; costa relatively broad but thin, rather lutescent, ending below the apex in the area of hyaline cells; lower and median leaf cells chlorophyllose, thin-walled, rectangular toward the base, becoming rhomboidal-hexagonal above, upper cells hyaline and colorless, averaging somewhat broader than the median and with thicker walls, more elongate at margin but not forming a distinct border. Sporophyte unknown.

TYPE: Wet, sandy soil, Lancetilla Valley, near Tela, Department of Atlántida, Honduras, altitude 20-600 meters, January 4, 1928, *Paul C. Standley 54032*.

The very concave, suborbicular leaves with a distinct pocket formed by the strongly cucullate apex distinguish this species at once from any of its allies in the section *Argyrobryum*.

Bryum coronatum Schwaegr.
Nos. 53240, 54106, 55634.

Bryum microbalanum Card.
No. 54326.

Bryum Crugeri Hamp.
No. 54033.

Bryum Standleyi Bartr., sp. nov. PLATE XVIII, FIGS. A-H.

Dioicous? Male flowers not seen. Plants short, densely tufted, pale green, not glossy, matted together with radicles in the lower parts. Leaves broadly ovate, somewhat shrunken and loosely flexuose-spreading when dry, erect-spreading when moist, the lower small and obtuse, the upper 2 mm. long, acute, slightly concave; margin narrowly recurved below, flat and denticulate in upper half; costa stout, tapering upward, percurrent in upper leaves, ending below apex in lower leaves; lower leaf cells oblong, narrower and elongated toward margin, upper cells rhomboid-hexagonal, thin-walled, 1 or 2 rows at margin narrower but hardly forming a distinct border; seta about 2.5 cm. long, reddish; capsule (immature) subcylindrical with a short neck, pendulous, about 2.5 mm. long; lid conic-apiculate.

TYPE: On log, vicinity of Tela, Department of Atlántida, at sea level, January 9, 1928, *Paul C. Standley 54261*. Also on logs, Lancetilla Valley, near Tela, altitude 20-600 meters: *Nos. 54327, 54373, 54379, 54437, 55350, 55641*. On rock, Lancetilla Valley, near Tela, *No. 54413*.

This species may be provisionally referred to the *Apalodictyon* group, including *B. Crugeri* and its allies, but it is readily distinguished from any of these species by the broadly ovate, short-pointed leaves which are more or less shriveled and loosely flexuose-spreading when dry. It is apparently common on old logs in the Lancetilla Valley near Tela, judging from the various collections enumerated above, and seems to be constant in general appearance and in microscopic characters. None of the capsules are ripe enough

to show the peristome characters in detail, but fragments of appendiculate cilia were clearly observed.

Bryum andicola Hook.
No. 55648.

Rhodobryum Beyrichianum (Hook.) Par.
No. 56491.

RHIZOGONIACEAE

Rhizogonium spiniforme (L.) Bruch.
Nos. 52902, 53953.

MEESEACEAE

Meesea Ulei C. M. PLATE XIX, FIGS. A-K.
No. 56114a.

I was at first tempted to believe that this collection from El Achote, which is in good fruit, represented an undescribed species, very close to *M. longiseta* of the north but differing in the recurved basal leaf margins, shorter setae, and smaller capsules. Subsequently a comparison with the description of *M. Ulei*, of Brazil, indicated that these characters are exactly those by which this species was differentiated.

Since no type material of *M. Ulei* is available and the evidence, as far as it goes, is entirely favorable, I have referred Mr. Standley's collection to the Brazilian species.

It would be hard to imagine a more unexpected genus in a tropical country, although I understand from Mr. Standley that several ferns and flowering plants typical of the flora of the northeastern United States have been found in the pine-forested region near Siguatepeque.

BARTRAMIACEAE

Philonotis tenella (C. M.) Besch.
Nos. 53477, 54030, 54031, 56704.

Philonotis sphaericarpa (Sw.) Brid.
Nos. 54455, 56136.

ORTHOTRICHACEAE

Macromitrium Podocarpi C. M.
No. 56202.

The combination of short branches, narrowly linear, acute leaves with incurved crispate points when dry, round-hexagonal, mammillose upper leaf cells with thin walls, and elongated basal cells with knoblike papillae distinguishes these plants at once from any species credited to North America. Unfortunately the collection is sterile, but the vegetative characters agree so closely with those of the Brazilian moss that I am satisfied it is either this or a very nearly related species. Strangely enough this is the only *Macromitrium* represented in the collection.

Micromitrium Schlumbergeri Schp.
No. 56517a.

Schlotheimia Sartorii C. M.
Nos. 54359, 55204, 56507.

HELICOPHYLLACEAE

Helicophyllum torquatum (Hook.) Brid.
No. 54392.

RHACOPILACEAE

Rhacopilum tomentosum (Sw.) Brid.
Nos. 52938, 55618.

CRYPHAEACEAE

Acrocryphaea mexicana Schp.
No. 55981.

PTEROBRYACEAE

Orthostichopsis tetragona (Sw.) Broth.
Nos. 53382, 54565, 54569, 55657, 55734.

METEORIACEAE

Pilotrichella rigida (C. M.) Besch.
Nos. 53201, 53966.

Papillaria appressa (Hsch.) Jaeg.
Nos. 54603, 55752, 56488.

Papillaria nigrescens (Sw.) Jaeg.
Nos. 52963, 54381, 54607, 54850, 55339, 55727.

Meteorium illecebrum (C. M.) Mitt.
No. 56203.

Meteoriopsis patula (Sw.) Broth.

Nos. 52770, 53207, 53384, 53492, 54616, 55510, 56476.

NECKERACEAE

Neckeropsis undulata (Palis.) Broth.

No. 55778.

Homalia glabella (Sw.) Mitt.

No. 52903.

Porotrichum plicatulum Mitt.

No. 55617.

It is interesting to note the occurrence of this species in Central America again, it having been collected by Mr. Standley in Costa Rica in 1924.[1] Both collections are from near sea level, and it is evidently a moss of the "tierra caliente."

HOOKERIACEAE

Cyclodictyon albicans (Sw.) Broth.

No. 54896a.

Callicostella cruceana (Dub.) Jaeg.

Nos. 54570, 55279, 55392, 55549.

This and the two following species have been distinguished as follows:

Dioicous.	
Seta papillose	*C. ciliata.*
Autoicous.	
Seta smooth	*C. cruceana.*
Seta papillose	*C. pallida.*

Numerous species of this difficult genus have been credited to tropical North America, but the distinguishing characters are so intangible that any satisfactory understanding of the species represented in these regions seems to be contingent upon a careful revision of the whole group.

Callicostella ciliata (Schp.) Jaeg.

Nos. 54562, 54844.

Callicostella pallida (Hsch.) Jaeg.

Nos. 53296, 54407, 54566, 55750.

Lepidopilum polytrichoides (Hedw.) Brid.

No. 53220.

[1]Contr. U. S. Nat. Herb. 26: 97. 1928.

Crossomitrium Herminieri (Schp.) Jaeg.
No. 54901.

This is another rare and attractive species previously known only from Guadeloupe and therefore a noteworthy addition to the moss flora of Central America. The pale yellow, glossy stems are closely applied to twigs and leaf surfaces of living trees. The lateral leaves are widely spreading and regularly arched with deflexed points, giving the stem a singularly attractive and characteristic appearance.

Rhynchostegiopsis flexuosa (Sull.) C. M.
Nos. 52898, 54633, 54644.

FABRONIACEAE

Fabronia flavinervis C. M.
No. 56489.

THUIDIACEAE

Rauia subcatenulata (Schp.) Broth.
No.55939.

Thuidium involvens (Hedw.) Mitt.
Nos. 54121, 54794.

Thuidium miradoricum Jaeg.
Nos. 53216, 54198, 54580.

Thuidium delicatulum (Dill., L.) Mitt.
Nos. 56105, 56328.

BRACHYTHECIACEAE

Brachythecium stereopoma (Spruce) Jaeg.

While this solitary collection of *Brachythecium* is sterile, I have been unable to distinguish it from *B. stereopoma*, of the West Indies and South America.

Rhynchostegium patulum Bartr., sp. nov. Plate XIX, Figs. L-T.

Autoicous. Male buds about 0.05 mm. long, of 5 or 6 ecostate, concave bracts, denticulate above the middle, enclosing 2-4 antheridia mixed with a few filiform paraphyses of about equal length. Stems prostrate, sparingly radiculose, irregularly branched, forming thin, glossy, pale green mats, slender and patulous, flattened, often flagelliform. Leaves complanate, slightly flexuose-spreading with decurved

tips when dry, more stiffly divergent when moist, oblong-ovate, bluntly acute, asymmetrical, slightly concave toward the base, flat above, up to 1.25 mm. long but usually smaller, margin plane, minutely denticulate nearly to the base; costa from one-half to two-thirds the leaf length, ending in a minute prickle on the back; upper leaf cells linear, vermicular, 10 to 12 times as long as wide, lightly papillose by projecting ends on the back, basal cells shorter and broader, rectangular with rounded corners toward the costa, narrower and more elongated toward the margins; perichaetial leaves clasping, the outer small, blunt, ecostate, the inner longer, costate, rather abruptly narrowed to an erect, denticulate, acuminate point; seta reddish, smooth, about 1 cm. long; capsule horizontal, short-ovoid, about 1 mm. long, constricted under mouth and gibbous at back when dry; annulus present; peristome normal; lid rostrate from a conical base.

TYPE: On wet rock, Lancetilla Valley, near Tela, Department of Atlántida, Honduras, altitude 20-600 meters, January 31, 1928, *Paul C. Standley 55305*.

The following numbers are from the same locality: *54414*, *54896*, *55258*.

Near *R. leptomerocarpon*, of Mexico, but smaller throughout, with shorter, narrower, more bluntly pointed leaves, more elongate areolation, a larger area of short, juxta-costal basal cells, and a smaller capsule.

ENTODONTACEAE

Erythrodontium longisetum (Hook.) Par.

Nos. 56498, 56517.

PLAGIOTHECIACEAE

Stereophyllum turgidulum Card.

No. 55938.

SEMATOPHYLLACEAE

Rhaphidorrhynchium obliquerostratum (Mitt.) Broth.

No. 56147.

Sematophyllum loxense (Hook.) Mitt.

Nos. 52771, 52934, 53223, 53482, 54851, 55588.

Sematophyllum galipense (C. M.) Mitt.

Nos. 55947, 56404, 56213, 56226, 56482.

Sematophyllum Kegelianum (C. M.) Mitt.

Nos. 53816, 54092, 54363.

Sematophyllum chrysocladum Card.
No. 56156.

Taxithelium planum (Brid.) Mitt.
Nos. 53121, 53227, 53239, 53527, 53995, 54377, 54426, 55329, 55784.

Trichosteleum microcarpum (Sw.) Broth.
Nos. 53663, 55632, 55635, 55638.

HYPNACEAE

Isopterygium miradoricum (C. M.) Par.
No. 56053.

Isopterygium diminutivum Bartr.
Nos. 55796, 55803.

When the description of this species was published[1] the specific name was, through a typographical oversight, misspelled. The correct name is as given above.

Vesicularia amphibola (Spruce) Broth.
Nos. 52636, 53210, 54431, 55907.

Microthamnium thelistegum (C. M.) Mitt.
Nos. 55945, 56422.

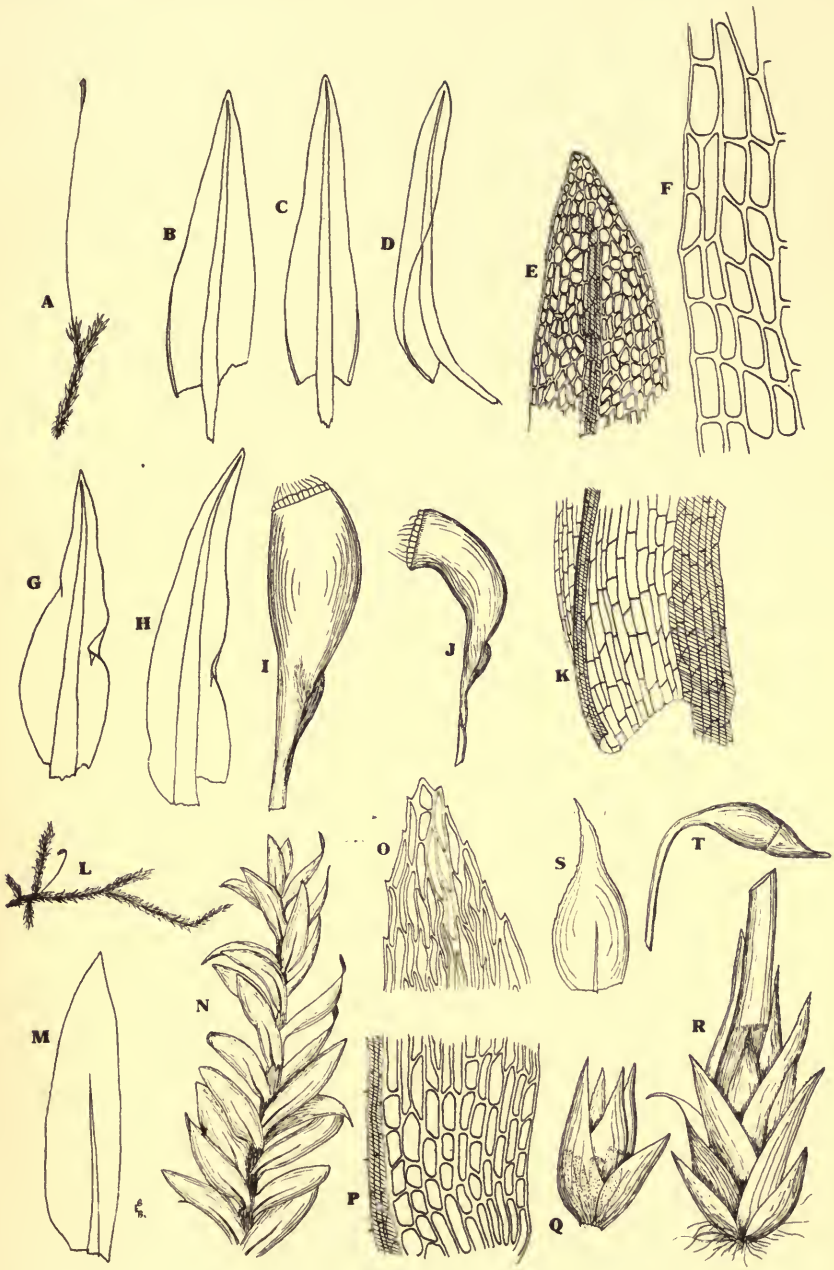
Microthamnium scalpellifolium C. M.
No. 54862.

Through the kindness of Dr. Reimers, of the Berlin Botanical Museum, it has been possible to compare this collection with the type material from Mazatenango, Guatemala, collected by Bernoulli and Cario, No. 82. They are absolutely identical.

The minute, squarrose-spreading, triangular-ovate stem leaves are clearly differentiated from the much larger, oblong-ligulate, abruptly acute, and very complanate branch leaves, so I am strongly tempted to think that Dr. Muller's intuition was not at fault when he originally placed this plant in *Microthamnium*.

The "folia caulina disticha densiuscule equitantia parva ***" of the original description[2] is inaccurate and misleading, and evidently refers to the branch leaves. Without the original specimen as a

[1]Journ. Wash. Acad. Sci. 18: 581. 1928.
[2]Bull. Herb. Boiss. 5: 214. 1897.



MEESEA ULEI AND RHYNCHOSTEGIUM PATULUM.

check, Dr. Brotherus may have been misled by this reference in transferring the species to *Isopterygium*[1] and later to *Taxiphyllum*.[2] The strongly complanate branches are very suggestive of some of the species now included in this latter genus but the fine, wiry, arched primary stems and dimorphous leaves seem to throw the balance clearly to the side of *Microthamnium*.

The rediscovery of this species is noteworthy and it is a satisfaction to be able to establish its identity.

POLYTRICHACEAE

Catharinaea angustata Brid. var. **rhystophylla** (C. M.) Dixon.
Nos. 56150, 56162.

In an attempt to reconcile these specimens with the Mexican *C. Schimperi*, from which they are indistinguishable, I can not avoid the conclusion that all these plants merely represent the variety *rhystophylla* (C. M.) Dixon of our familiar species. There are certainly no structural differences between these tropical plants of high altitudes and *C. angustata* Brid., and every variation in size, number and height of the lamellae, shape and length of the capsule, etc., can be found in collections from temperate regions. The leaves of the Mexican and Honduran plants are more crisped when dry, the lamina is more strongly undulate and more sharply spinose on the margins and back, all of which are marks of the variety *rhystophylla*, as evidenced by authentic specimens received from Mr. H. N. Dixon. Identical plants combining these characters have been collected recently in the mountains of Jamaica by Mr. C. R. Orcutt, and I fail to see what practical purpose is served by maintaining the southern form as a distinct species.

The synonymy of this variety in tropical North America, as I understand it, is as follows:

Atrichum Mulleri Schp. in herb. in Besch. Mem. Soc. Sci. Nat. Cherbourg 16: 206. 1872.

Atrichum Schimperi Jaeg. Ber. St. Gall. Nat. Ges. 1877-78: 439. 1879.

Atrichum conterminum Card. Rev. Bryol. 37: 5. 1910.

Atrichum Mulleri var. *conterminum* Ther. Smiths. Misc. Coll. 78[2]: 20. 1926.

[1]Engl. & Prantl, Planzenfam. I[3]: 1080. 1909.
[2]Engl. & Prantl, Planzenfam. Ed. 2. 11: 462. 1925.

Catharinaea Schimperi Broth. in Engl. & Prantl, Planzenfam. 1^3: 673. 1909.

Catharinaea contermina Broth. in Engl. & Prantl, Planzenfam. Ed. 2. 11: 495. 1925.

If the facts have been interpreted correctly it would seem that this variety should be designated as *Catharinaea angustata* Brid. var. **Mulleri** (Schp.) comb. nov.

EXPLANATION OF PLATES

Plate XVII

Campylopus hondurensis Bartr.

Fig. A. Fruiting plant × 1⅓.
B. Plant with microphyllous branches × 1⅓.
C. End of stem with microphyllous branches × 14.
D. Tip of stem and sporophyte × 9.
E, F. Stem leaves × 19.
G. One side of leaf base × 90.
H. Apex of leaf × 90.
I. Upper leaf cells and margin × 570.
J. Part of cross-section of costa × 285.

Splachnobryum Bernoullii C. M.

K. Fruiting plant × 1⅓.
L. Fruiting plant × 9.
M. Operculate capsule × 19.
N. Stem leaf × 45.
O. Apex of leaf × 300.
P. Juxta-costal leaf cells near base × 300.
Q. Part of cross-section from upper half of leaf × 300.
R. Part of cross-section from lower part of leaf × 300.
S. Part of peristome and rim × 300.
T. Median exothecal cells × 300.

Plate XVIII

Bryum Standleyi Bartr.

Fig. A. Moist plant × 1⅓.
B. Lower stem leaf × 11.
C, D. Upper stem leaves × 11.
E. Apex of stem leaf × 50.
F. One side of leaf base × 50.
G. Upper leaf cells and margin × 300.
H. Moist capsule × 11.

Bryum bursiforme Bartr.

I, J. Plants × 1⅓.
K. End of stem × 11.
L. Stem leaf, dorsal view × 50.
M. Stem leaf, ventral view × 50.
N. Hyaline cells at base of acumen and margin × 300.
O. Group of basal cells midway between costa and margin × 300.

Plate XIX

Meesea Ulei C. M.

Fig. A. Plant × ⅔.
B, C, D. Stem leaves × 18.
E. Apex of stem leaf × 90.
F. Upper leaf cells and margin × 285.
G, H. Perichaetial leaves × 10.
I. Moist capsule × 9.
J. Dry capsule × 9.
K. One side of leaf base × 90.

RHYNCHOSTEGIUM PATULUM Bartr.

L. Plant × 1⅓.
M. Branch leaf × 50.
N. Tip of branch × 19.
O. Apex of leaf × 285.
P. One side of leaf base × 285.
Q. Antheridial bud × 50.
R. Perichaetium × 50.
S. Inner perichaetial leaf × 50.
T. Moist operculate capsule × 9.